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ABSTRACT

A study was conducted to determine which contemporary and anticipated societal problems may be amenable to treatment with the aid of communication resources. This paper first discusses the initial phase of the study, in which a search was conducted to determine the social science rationale for societal problem research, evidence of previous analyses of societal problems, and the usefulness of the Delphi method in accomplishing the study's objectives. It then describes the use of the Delphi method in obtaining communication scholars' responses to the following questions: Which societal problems are perceived as having a high priority? Are priority assessments changed when problems are viewed interdependently instead of independently? Does the communication field have current or future resources that can be applied toward the solution of priority problems? The paper then presents a series of tables that synthesize the respondents' perceptions of problem importance and the susceptibility of specific problems to the efforts of communication scholars. (GW)

The Application of Communication Resources to Problems of Social Significance

by

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The Application of Communication Resources to Problems of Social Significance

This research sought to identify problems which threaten the well-being of human society and to discover specific resources that an academic discipline could contribute toward the solution of such problems. More specifically, the study attempted to determine which contemporary and future societal problems are amenable to treatment and/or ultimate solution with the assistance of the communication field's resources.

During the late sixties, the social relevance movement in speech communication challenged the field to look for ways to apply its research and instruction to the problems of contemporary society. However, the scale and complexity of societal problems are such that application cannot be made without comprehensive planning and on-going research. The urgency to respond to this situation, in a fashion that would combine exploratory research and inventive planning, provided the impetus for this study.

The primary research question under consideration was:

> Upon which priority societal problems can the communication field focus its resources?

In order to answer this question, several investigative questions were posed which, in addition to organizing each phase of the inquiry, directed a search for: (1) the social science rationale for societal problem research, (2) evidence for previous analyses

of societal problems, and (3) a determination of the Delphi method's utility for accomplishing the study's objectives. Guided by the information generated by these preliminary inquiries, a set of procedures were devised and implemented to answer the remaining investigative questions, and consequently, the research question. The Delphi method, an iterative procedure for the systematic solicitation and collation of opinion, provided the framework for the execution of these procedures and an umbrella-like mechanism under which two additional techniques (Nominal Group Technique was used for selecting the respondent group and Cross-Impact Analysis for examining interactions among high priority problems) could be used.

In the next few pages I will review and discuss the findings of the investigative questions in order to provide a thorough summary of each phase of the study. The first question is concerned with the legitimacy of societal problem research in the social sciences and asks:

1. Have the social sciences, and particularly communication, provided a rationale for societal problem research?

My survey of the social sciences selectively focused on disciplines whose basic research stance was beginning to shift toward applied research. At national levels, societal problem research was perceived to be an important academic pursuit. This was supported by evidence of increased federal funding over the last few years and by statements of encouragement from prestigious professional organizations. At the disciplinary level, fields such as psychology, political science, and communication have

reinforced the notion that their members should be seeking the causes for social ills not merely doctoring the symptoms. This pronouncement has been communicated in articles, convention programs, and keynote addresses. In particular, the communication field has gently chided its scholars for not devoting suffitient effort to pressing social problems and has stressed, but not mandated, the importance of designing and executing research dealing with discipline-related aspects of societal problems. Beyond advocating the need for problem-focused research, there was little found in the way of actual research activity in any of the fields surveyed. This situation was welcomed as a unique opportunity. From the examination of this topic, I concluded that the communication discipline had demonstrated interest and responsiveness to social issues which might manifest itself in a willingness to participate in exploratory research.

Once it was apparent that a rationale existed, the next step was to search for the contributions of previous researchers to this problem. The question which addressed this issue was:

2. Is there evidence of previous efforts to analyze contemporary and future societal problems systematically?

Systematic attempts to identify and analyze societal problems were found to be in an early stage of development with the majority of studies occuring during the last five to seven years. Some of the studies reviewed were not strictly systematic

in that they did not lend themselves to replication; yet, among this group were highly respected writers (e.g., Platt, 1969, 1972) who had a tremendous influence on the study of societal problems. Several findings from this inquiry were especially fruitful for the present investigation: (1) The lack of emphasis on solutions for societal problems created another reason for conducting this study and, more importantly, provided greater flexibility in designing a procedure for gathering information on resources; (2) The problems identified by previous researchers constituted a valuable compendium of issues for use in preformulating a problem inventory (to be used later in primary data collection); (3) The McHale survey (Streatfeild, 1974), which showed that the ability to recognize priority societal problems transcends disciplinary interests, was accepted as ample justification for asking communication scholars to analyze problems outside their primary area of expertise; and (4) Although previous researchers acknowledged that a standardized problem search methodology did not exist, the Delphi method had been employed with enough success to warrant its tentative consideration for use in this investigation.

The third question reviewed various aspects of Delphi in order to answer the question:

3. Is Delphi a suitable method for accomplishing the objectives of this research?

An indepth examination of the Delphi method revealed several good reasons for using it. Among these were Delphi's value in soliciting and collating human judgement on issues where hard

data is unavailable, too costly to obtain, or when various logistical, problem-specific, or respondent-oriented factors inhibit the use of conventional group methods. A comparison of Delphi with other methods was made and its advantages as a planning instrument and its superiority for eliciting and processing information were apparent. After reviewing several methodological limitations and considerating the available critical literature, it remained clear that Delphi had sufficient power and efficiency to accommodate the objectives of this study.

Based on these findings and the related Delphi literature, a modified Policy Delphi (Turoff, 1975) was devised. The design consisted of three iterations and incorporated the essential features of anonymity, controlled feedback, and statistical group response. Nominees for the Delphi respondent group were generated by means of the Nominal Group Technique (Delbecq, Van de Ven, & Gustafson, 1975). The Nominal Group, composed of the dissertation committee and me, generated 114 names of prominent communication scholars that met five criteria--descriptions of a future-oriented, global mind-set--and then reduced this number to 45 through a voting process. Thirty-three individuals agreed to participate in the study (see Delphi Respondent Group, Appendix A).

The fourth investigative question was directed to the respondents and asked:

4. Which societal problems are perceived as having a high priority? —

Two iterations of the Delphi were necessary to complete this inquiry. The objective of the first iteration was to prepare a comprehensive inventory of societal problems. To accomplish this, a preformulated list of problems, derived from the review of literature, was used as a stimulus for comments, revisions, and additions from the respondents. The compiled returns from 88% of the respondent group produced 120 societal problems (roughly twice as many as the preformulated list). In the second iteration, the refined inventory was sent back to the respondents to be prioritized. Since the number of problems was too large to rank order, a 5-point importance scale was employed to rate each problem. The results, tabulated from a 91% return, revealed 19 priority problems. With one possible exception these problems were similar to those found by other researchers, e.g., the McHale survey (Streatfeild, 1974), NICB (Linstone & Turoff, 1975), and the Stanford study (Markley, Curry, & Rink, 1971). The exception centered on what seemed to be a preoccupation with "Armageddon-type" problems: 7 of the 19 problems were related to warfare and destruction. This finding may be a function of the way the problems were stated, or that more problems of this kind exist, or both. One respondent remarked that these findings suggest that "the 'prominent' people in speech communication are all dutiful readers of the national press." The issue of whether the national press (or the world press, for that matter) creates or simply reflects perceptions of priority problems is tangential to this study. What is

significant, however, is that the data confirms McHale's thesis that perceptions of world priorities are beginning to transcend specialized fields of study and local-national interests.

The fifth and sixth investigative questions were examined by means of the third round questionnaire. (There was a 70% response rate for this round.) Because these two inquiries were potentially complex and time consuming, only the top nine priority problems were addressed: potential for mass destruction, nuclear weapons access and control, water pollution, malnutrition and famine, alternatives to fossil fuels, worldwide armaments growth, unemployment, inflation, and air pollution. Using these problems as foci, the fifth question was concerned with the way in which priorities are determined:

5. Are priority assessments changed when problems are viewed interdependently instead of independently?

In past studies, respondents have noted that the dynamic behavior of societal problems is not adequately accounted for by priority ratings or rankings. The world modelling literature also operates from this premise. If it was possible to secure an approximation of the problems' systemic and interactive behavior without sophisticated simulation techniques, I thought it was worth exploring. The search for a means of attaining this objective resulted in an adaption of cross-impact analysis (Ralph, 1971; Enzer, 1970; Gorden & Hayward, 1968; Kane, 1972). A computer program was also prepared to profile the increases and decreases in seriousness that occur

in a problem complex when one problem hypothetically reaches crisis proportions. A matrix was produced by the program to portray the respondents' impressions of paired problem interactions (see Appendix B) under the hypothesized conditions. Mean interaction scores were then computed across rows of the matrix to create a composite impact value for each problem. From these values, problems with immense potential to impair other issues could be identified. In Table 1 you will note that by correlating the rankings of the composite impacts with the ranked priority ratings from the second round, it was discovered that the respondents' notions of priority not only changed from the original ratings but there was also no relationship between the results of the two forms of assessment ($r_s = -.47$, NS $p > .05$). Although cross-impact analysis clearly

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Insert Table 1 about here
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causes the respondent to think through the various aspects, effects, and implications of a problem and assists in the recognition of unique problem behaviors, the manner in which this inquiry was conducted did not permit sufficient control to adequately test both forms of assessment. For example, the specified conditions for impact were hypothetical, the same respondents sequentially performed both analyses, and there was a limited number of problems to manipulate. Nonetheless, I believe that this finding is worthy of further investigation.

The last question, by employing the findings of the second

iteration, sought to gather the remaining information needed to satisfy the research question:

> 6. Does the communication field have current or future resources which can be applied toward the solution of priority problems?

The resource formulation section of the questionnaire had a simple design: the respondent was asked to match candidate resources with priority problems. The materials were prepared in tabular form as shown in Figure 1. Respondents were pro-

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Insert Figure 1 about here

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vided with an overview of the task and nature of resources. This was followed by a set of guidelines to assist them in nominating resources. They were then asked to deal with problems about which they felt most knowledgeable. It was suggested that candidate resources might be thought of as falling under two different source categories: (1) the conventional wisdom of the field, e.g., conversations with colleagues, discussions at professional meetings, the literature, and the like; and (2) ideas new to the respondents, i.e., ideas they had never heard before or "far out"--imaginative and uniquely creative--applications. The respondents were also to indicate which of their candidate resources were currently available and which were likely to become available in the future. Finally, they were to briefly state the relationship between the resource and the problem, e.g., to which aspect of the problem does the resource apply and how?

Several interesting results were produced: the field does indeed have current and future resources that can be applied to each priority problem and resources which are generally useful for all of them. Additionally, the system by which the resources were classified exposed some statistically significant differences between the current and future availability of resources and the sources of ideas from which the resources were generated. The data pointed to the conclusion that over 50% of the resources that our field has to offer for priority problems are now available and based upon the conventional wisdom of the field. In contrast, the next largest concentration of resources, approximately 40%, are yet to be developed and will not be available for some time. The remaining 10% were permutations of the above categories.

Table 2 extends the analysis of sources of resource ideas/availability in showing a further delineation by problem.

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Insert Table 2 about here
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The remainder of this paper is devoted to the presentation of individual resources for each problem area. The resources displayed in Tables 3 through 9 were arranged, where possible, to show similarity of theme; however, a qualitative evaluation should not be construed from the order. The reader will also note that some resources of the "new, future" genre do not appear to be indigenous to the discipline. However, since their acceptance and implementation would likely require the knowledge and abilities offered by the field, it was considered inappropriate to exclude them from the compilation.

These tables also represent the product of this study in that they are the synthesis of the respondents' perceptions of problem importance and the susceptibility of various problems to efforts by members of our field.

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Insert Tables 3-9 about here

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Like most exploratory research, this study aspired to the goal of developing potentially fruitful and more theoretically sound avenues for further research. To a great extent, the goal was realized in the outline of resources and applications presented in Tables 3 through 9. As a modest "map of the fronts", this classification does not provide the "hundreds of thousands" of implications for urgent studies that Platt (1972) contends are needed for all the sciences, but it does propose numerous opportunities for the field of communication.

To implement this study's conclusions, it will be vital to discover the available delivery systems, deployment mechanisms, or interface structures necessary to transform ideas into action. This will necessitate a different kind of resource investigation. Moreover, the present study has made only the first step in resource analysis. It would be productive to evaluate qualitative differences among the field's resources: Which, for example, have the greatest potential for major breakthroughs? Which will generate the greatest ameliorative, preventive, or compensatory effects? Under what conditions? Which future resources will require the most time, effort, or cost in development? How can

we estimate their payoffs in advance. Answers to these questions are essential to any concerted attack on the pressing issues of our day.

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Table 1

Problem Rankings from Rating and Cross-Impact Assessments

Problem	Rankings from Importance Rating		Rankings from Composite Cross-Impacts	
	$\bar{X}$	Rank	Composite Impact	Rank
1. Potential for mass destruction (regional and global)	4.67	1	.80	6
2. Nuclear weapons: control by governments; potential access by small groups and individuals	4.60	2	.77	8
3. Water pollution	4.40	3	.64	9
4. Malnutrition and famine (agricultural production; food storage-distribution; food surpluses)	4.37	4	.86	4
5. Alternatives to fossil fuels	4.37	5	.99	2
6. Growth of armaments worldwide	4.33	6	1.10	1
7. Unemployment	4.33	7	.79	7
8. Inflation	4.27	8	.82	5
9. Air pollution	4.23	9	.87	3

Table 2

Observed Joint and Marginal Frequencies of

Resources and Their Availability for Specific Problems

Sources of Resource Ideas by Availability \ Priority Problems	Armaments-Nuclear Control-Mass Destruction	Water and Air Pollution	Malnutrition and Famine	Alternatives to Fossil Fuels	Unemployment	Inflation	Marginal Resource Distribution
Conventional Wisdom/ Available	12	7	4	4	3	2	32
Conventional Wisdom/ Future	2	1	0	0	1	0	4
New Idea/ Available	0	1	0	1	0	0	2
New Idea/ Future	6	3	4	3	3	2	21
Marginal Problem Distribution	20	12	8	8	7	4	59

Table 3

Communication Resources for All Priority Problems

Derivation of Resource: Conventional Wisdom of Field	Derivation of Resource: New	Availability[a]	Relation to Problem/Application
Communication experts with knowledge and abilities in: Conflict Resolution/ Management Negotiation Persuasion Political Communication Group & Organizational Communication/ Decision Making Diffusion of Innovations/ Information Intercultural (Cross- and Subcultural) Communication Probing for causes and solutions to problems		A	Communication knowledge and the whole reflective thinking, problem-solving process is fundamental to the resolution of urgent social concerns; knowledge in these areas could be utilized by government, military, industry, and other groups to deal with potential crises.
	Using our knowledge of persuasion to help good people (or those we believe to be good and able) get elected to major political office	A	The greater the problem, the greater the need for able leadership.
	Politicization of the field	P	
	A program to develop and/or pretest methods for diffusion of innovations/information.	F[b]	Improved efficiency and general effectiveness of diffusion attempts can be obtained by using existing empirical methods and other resources to serve people that generate information on each problem. In cases where these individuals believe they are experts on communication, we would have to show them that we could provide a benefit that they really are not able to produce themselves.

[a] The letter A indicates that the resource is currently available; F signifies the likelihood of future availability.

[b] Much of the resources necessary to implement such a program are currently available.

Table 4

Communication Resources for Armaments Growth, Nuclear Weapons Control, and the Potential for Mass Destruction

Derivation of Resource			
Conventional Wisdom of Field	New	Availability[a]	Relation to Problem/Application
Communication and Conflict Theory; Conflict Resolution Techniques		A	By reducing conflict, wars and political crises that might lead to nuclear utilization can be forstalled. The need to make alternatives to mass destruction work. Arms limitation agreements. Nuclear weaponry is a problem because of its potential for mass destruction.
Ability of field to develop more effective conflict resolution techniques		F	New, improved, more abundant, and more effective techniques are needed to facilitate resolution of crises by verbal means.
Conflict Management Techniques		A[b]	By recognizing conflict as endemic but channeling it into nonviolent outlets, wars may be forstalled.
Intercultural Communication principles and strategies		A	Promote reduction of tensions; intervention in human conflict; reduction of fear by promoting understanding.
	Cultural perception habits	F	How people perceive others, certain "dangers," etc.
Information exchange		A	Reduce fear, panic
Theories of persuasion, negotiation, problem-solving, discussion, group/organizational decision-making, organizational communication, and attitude change.		A	Talking problems through as alternatives to violence; facilitating the understanding of problems and promotion of alternatives; searching for ways of achieving agreement; demonstrating the counter-productivity of armed might as a means of coping with problems. Tempering imprudence and managing change; facilitating influence on bureaucracies.
Control of rumor		A	Surveillance of false alarms.
Literature on social control		A	
Instantaneous Global Telecommunications		A	Like a "hotline" it may help reduce the possibility of a holocaust by accident.
	A Department of Peace within the Office of the Secretary of State	F	The U.S. government needs an official organ whose responsibility would be to explore the question of how to create and maintain peace. The function of such an agency would be to engage in policy making discussions on conditions leading to peace and our government's role in creating such conditions.
	Special information on principles of popular communication of technical information	F	
	Sharing goods and services	F	Easing need for aggression.
	Development of neighborhood organizations	F	

Table 4--Continued

Derivation of Resource			
Conventional Wisdom of Field	New	Availability[a]	Relation to Problem/Application
Osgood's policy proposal: Gradual Reduction in Tension		A	Alternatives to war
Abilities of communication theorists/scientists/ artists to develop a "universal or international audience or public" through mass communications to create near universal perception of problems		F	The global community is dependent on the process of communication to form the sense of community; in this case, communication of certain kinds to motivate cooperative activity on a scale never achieved in the past.
Providing help to those who would articulate the advantages of dialog over violence		A	Helping to preserve the viability of discussion as an alternative to threats and violence.
People, money		A	Discussion and publication to make problems and possible solutions visible.
	An international conference of nuclear and non-nuclear nations	F	The SALT talks exclude too many countries affected by nuclear powers. This conference would attempt to discover means of achieving reduction in nuclear armaments.

[a]The letter A indicates that the resource is currently available; F signifies the likelihood of future availability.

[b]Currently available for individual, group, and organizational levels of society but not yet at the international level (per respondent).

Table 5

Communication Resources for Water and Air Pollution

Derivation of Resource			
Conventional Wisdom of Field	New	Availability[a]	Relation to Problem/Application
Training environmentalists to become better persuaders		A	A significant improvement in persuasive ability would assist in securing more public support and lead to more pro-environmental change.
Theories of group process and leadership		F	Develop leadership in community groups (ultimately national groups) that know how to organize in an effective way to apply political pressure.
	Information and theories of communication in community action	F	Development of community action; reduction of jurisdictional problems, etc.
News emphasis, persuasive campaigns, advertising techniques		A	Increase public awareness with consequent pressure on government, business, and individuals for wiser conservation practices.
Theories of persuasion and attitude change		A	Ephance and facilitate changes in water use, treatment, and other practices.
Theories of diffusion of innovation/information		A	Need to get communities, companies, and individuals to adopt new devices and procedures.
Organizational Communication		A	Facilitate action within and among public and private agencies.
Meetings and group sessions involving concerned parties		A	
Better public education, via more effective communication		A	
	Public interest groups brought to bear in order to persuade government agencies (and the public to enact effective legislation	A	The essential relationships are power politics and public information/ persuasion.
	More balanced distribution of population; new methods of distributing goods and services	F	Reduced crowding in overpopulated production centers.
	Commission on Water Pollution Control whose primary function would be to identify means of making the control of water pollution profitable	F	Contribute by finding ways of appealing to profit motive of American business than to its sense of public responsibility.

[a]The letter A indicates that the resource is currently available; F signifies the likelihood of future availability.

Table 6

Communication Resources for Malnutrition and Famine

(Agricultural production; Food Storage-Distribution; Food Surpluses)

Derivation of Resource			
Conventional Wisdom of Field	New	Availability[a]	Relation to Problem/Application
Theories of persuasion, diffusion of innovation/ information; news emphasis and advertising techniques		A	Promotion of new health/food production practices; people in developed countries need to be moved to consume less; public information campaigns directed toward a change in patterns of fertility; giving guidance to change agents regarding methods of gaining adoption of change in agricultural methods; and, creating attitudes of sharing among nations.
Information theory, information dissemination		A	Instrumental for getting resources to where they are needed; dissemination of useful information on food, etc.
A network analysis by organizational communication specialists could locate and predict problems in a food distribution system		A	Getting food to where it is needed depends not so much on a transportation system as an effective communication network operating in agencies charged with distribution (e.g. distribution problems in India, 1975). Possible application of ICA Communication Audit.
	Sophisticated communication networks might transcend parochial supply and demand influences toward the end that production and delivery could be rendered maximally efficient.	F	
	Information channels best suited to influence various producing and consuming units, individuals, etc.	F	Contribute to new practices at varying levels of production and consumption.
People, time, facilities		A	Through speeches, discussion, and conferences, delineate problem and suggest approaches. People with expertise in the specific problem can bring to bear specific competencies.
	Monthly meetings of community regional leaders with consensual suggestions sent to appropriate government agencies	F	
	New sources of food	F	Some "have-not" countries may have unknown sources of food.

[a]The letter A indicates that the resource is currently available; F signifies the likelihood of future availability.

Table 7

Communication Resources for Energy

(Alternatives to Fossil Fuels)

Derivation of Resource			
Conventional Wisdom of Field	New	Availability[a]	Relation to Problem/Application
Persuasion theory; news emphasis, advertising techniques, personal contact methods and direct mail		A	Creating awareness of alternatives and "selling" them; selling installation and use of energy saving methods/devices (e.g. solar technology)
	Development of powerful interest groups sufficient to influence effective legislation; and, equally effective messages directed at mass audiences	A	
	An organized effort by legislators to encourage the creation and production of alternative energy systems	F	Strict enforcement of campaign expenditure laws would make legislators less dependent on oil companies and more receptive to the benefits of non-fossil sources of energy.
	Special information on principles of popular communication of technical information	F	Facilitate general understanding of problems and alternatives.
	Slower life style, fewer things	F	Increased appreciation of "being" instead of "having." Upgrading value of human relations.
People, problem-solving techniques		A	Interdisciplinary conferences to articulate problems.
Training for opinion leaders in discussion leadership, public speaking		A	
Speakers, community organizations, publications, articles, legislative assemblies		A	

[a]The letter A indicates that the resource is currently available; F signifies the likelihood of future availability.

Table 8

Communication Resources for Unemployment

Derivation of Resource			
Conventional Wisdom of Field	New	Availability[a]	Relation to Problem/Application
Enhancement of communication skills among unemployed; retraining for improvement of communication skills and other skills for which there is demand; training for jobs involving communication		A	Lack of communication skills is a pervasive cause of unemployment; upgrading skills of the unemployed.
	Development of new skills	F	Skills needed but not yet part of ordinary training programs.
Communication experts		F	Development of the field of "applied communication" will create new jobs and will help society in general to become more sophisticated in managing human resources.
Theories of group process		A	Facilitate the development of new industries or more jobs:
Rhetoric of Agitation and Control		A	Induce powerful establishments to respond to social needs.
	Developed understanding of "communicative competence" as contrasted to linguistic competence	F	This is a frontier today but it appears that linguistic competence alone is not enough for social effectiveness though what has been assumed as literacy has been applied as the test of readiness for social functioning.
	A group charged with the responsibility of finding realistic limits to personal income and the relationship of extraordinary personal income to unemployment/inflation	F	

[a]The letter A indicates that the resource is currently available; F signifies the likelihood of future availability.

Table 9

Communication Resources for Inflation

Derivation of Resource			
Conventional Wisdom of Field	New	Availability[a]	Relation to Problem/Application
Persuasion theory		A	One of the major causes of inflation is psychological; the confidence and belief of the public and the shaping of their behavior are critical for control of inflation. A means for mass influence of economic practices and economic negotiation.
	Knowledge of communication principles for dissemination of technical information	F	Widespread understanding of economic data, principles, and policies are essential to control inflation.
Consumer organization		A	
	Increased appreciation of "being" instead of "having"	F	Decreased emphasis on scarce goods.

[a]The letter A indicates that the resource is currently available; F signifies the likelihood of future availability.

Figure 1

Format for Resource Formulation

PROBLEM	RESOURCES			
	Source: conventional wisdom of the field	Source: new to you	How does resource relate?	A[a] / F
Air Pollution				

[a]The respondent inserted an A or F in this column to indicate that the resource is currently available (A) or likely to be available in the future (F).

APPENDIX A

RETURNS OF INDIVIDUAL RESPONDENTS

Respondent	Round 1	2	3
Carroll C. Arnold	X	X	X
Molefi K. Asante	X	X	X
Samuel L. Becker	X	X	X
Lloyd F. Bitzer	X	*	X
Paul H. Boase	X	X	X
Ernest G. Bormann		X	X
John W. Bowers	X	X	X
Theodore Clevenger, Jr.	X	X	X
Herman Cohen	X	X	
Gary Cronkhite	X	X	
Frank X. Dance	X	X	X
Joseph DeVito	X	X	X
Kim Griffin	X	X	X
Alvin Goldberg	X	X	X
Dennis S. Gouran	X	X	X
Franklyn S. Haiman		X	X
Paul D. Holtzman		X	
Dominic Infante	X	X	X
James C. McCroskey	X	X	X
Gerald Miller	X	X	
Edward J. Pappas	X	X	X
Michael H. Prosser	X	*	
W. Charles Redding	X		
Gary M. Richetto	X	X	
James Roever	X	X	X
Lawrence W. Rosenfield	X	X	*
Thomas M. Scheidel	X	X	
Robert L. Scott	X	X	X
David H. Smith	X	X	X
Philip K. Tompkins		X	
Lawrence R. Wheeless	X	X	X
Frederick Williams	X	X	X
William Work	X	X	X
Totals	29	30	23

n = 33

* Responses received after data processing was completed are not included in totals.

APPENDIX B

A CROSS-IMPACT ANALYSIS OF PRIORITY SOCIETAL PROBLEMS

Instructions: The question being addressed in this activity is: "If, by 1980, (insert problem ROW description) were to reach crisis proportions, what impact would it have on (insert problem COLUMN description) ?"

For example, "If, by 1980, the problem of securing suitable alternatives to fossil fuels were to reach crisis proportions, to what extent would the problem of air pollution increase, decrease, or not be affected?"

Using the scale which appears below the matrix, judge the degree of impact of each set of relationships in the matrix.

IF THIS PROBLEM REACHED CRISIS PROPORTIONS BY 1980 . . .

TO WHAT EXTENT WOULD THIS PROBLEM BE AFFECTED?

		1 Potential for mass destruct'n	2 Nuclear weapons control	3 Water pollution	4 Malnutrition and famine	5 Alternatives to fossil fuels	6 Growth of armaments worldwide	7 Unemployment	8 Inflation	9 Air pollution
Potential for mass destruction (regional and global)	1									
Nuclear weapons control	2									
Water pollution	3									
Malnutrition and famine	4									
Alternatives to fossil fuels	5									
Growth of armaments worldwide	6									
Unemployment	7									
Inflation	8									
Air pollution	9									

Maximum DECREASE in seriousness, magnitude, intensity — -3 -2 -1 0 +1 +2 +3 — Maximum INCREASE in seriousness, magnitude, intensity

* The + sign indicates an increasing impact, the -sign a decreasing impact; and, 0 signifies no appreciable impact.